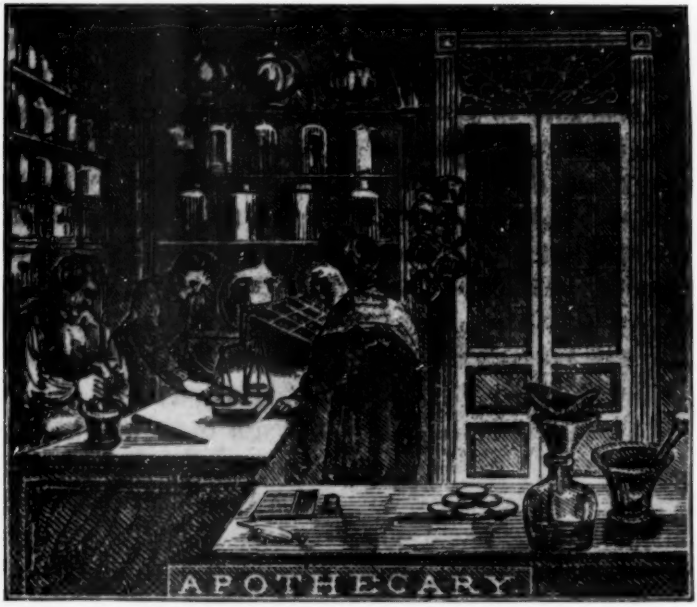
American Journal of Pharmacy

AND THE SCIENCES SUPPORTING PUBLIC HEALTH



EARLY NINETEENTH CENTURY PHARMACY
(see p. 344)

Since 1825 *October 1954*

Bacteriology - - Biology
Chemistry - - Pharmacy

Founded 1821

Undergraduate courses of study at this, the oldest college yet most modern of its type in America, help prepare for interesting careers in these four health sciences. Selected Graduate studies available also. Co-educational. Classes commence each September.

Catalog available on request.

Philadelphia College of Pharmacy and Science

43d Street, Woodland and Kingsessing Avenues

Philadelphia 4, Pa.

American Journal of Pharmacy

Published monthly by the Philadelphia College of Pharmacy and Science
43d Street, Kingsessing and Woodland Avenues, Philadelphia 4, Pa.

Annual Subscription $4.00 — Foreign Postage, 25 Cents Extra
Single Numbers, 40 Cents — Back Numbers, 50 Cents

Entered as Second-Class Matter March 27, 1937, at the Post Office at Philadelphia, Pa.
Under Act of March 3, 1879

Feature the modern,

powerful hematinic 'Trinsicon'

(Hematinic Concentrate with Intrinsic Factor, Lilly)

New Formula—
More Potent Than Ever

A part of the vitamin B_{12} and intrinsic factor is now presented as the new official complex: Vitamin B_{12} with Intrinsic Factor Concentrate, U.S.P. Potent Special Liver-Stomach Concentrate, Lilly, remains as a major component in the new formula.

Dose: In any treatable anemia, only 2 pulvules a day.

Each pulvule provides:

Special Liver-Stomach Concentrate, Lilly (Containing Intrinsic Factor)	150 mg.
Vitamin B_{12} with Intrinsic Factor Concentrate, U.S.P.	1/2 U.S.P. unit (oral)*
Vitamin B_{12} (Activity Equivalent)	7.5 mcg.
Ferrous Sulfate, Anhydrous	300 mg.
Ascorbic Acid	75 mg.
Folic Acid	1 mg.

*One U.S.P. unit daily produces a standard response in the average uncomplicated case of pernicious anemia.

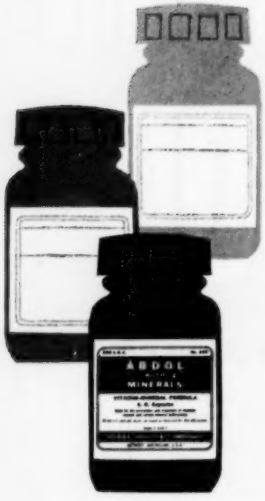
Supplied in bottles of 60, 500, and 5,000 (No. 2).

'Trinsicon' is the leader in its field.
Be sure you always carry adequate stocks.

Lilly

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U.S.A.

a new vitamin-mineral formula!



ABDOL®

WITH

MINERALS

comprehensive—economical

A popular addition to the fast-moving Parke-Davis vitamin family, ABDOL With MINERALS measures up to these requirements:

comprehensive formula—supplies liberal amounts of 10 valuable vitamins, and 11 important minerals...available at a price to meet the average pocketbook.

for patients of varied types—active adults who are likely to need increased vitamin-mineral intake, adolescents, convalescents, geriatric patients, pregnant or lactating women.

extensively promoted—kept uppermost in your doctors' minds by widespread detailing programs.

Each ABDOL With MINERALS Capsule contains:

Vitamin C (ascorbic acid)	50 mg.
Vitamin B_2 (riboflavin)	2.5 mg.
Vitamin B_{12} (crystalline)	1 mcg.
Vitamin B_6 (pyridoxine hydrochloride)	0.5 mg.
Vitamin B_1 Mononitrate	2.5 mg.
Nicotinamide (niacinamide)	20 mg.
Vitamin A	5,000 units
Vitamin D	1,000 units
Calcium Pantothenate	2.5 mg.
Folic Acid	0.1 mg.
*Iodine	0.15 mg.
*Manganese	1 mg.
*Cobalt	0.1 mg.
*Potassium	5 mg.
*Molybdenum	0.2 mg.
*Iron	15 mg.
*Copper	1 mg.
*Zinc	0.5 mg.
*Magnesium	1 mg.
*Calcium	44 mg.
*Phosphorus	34 mg.

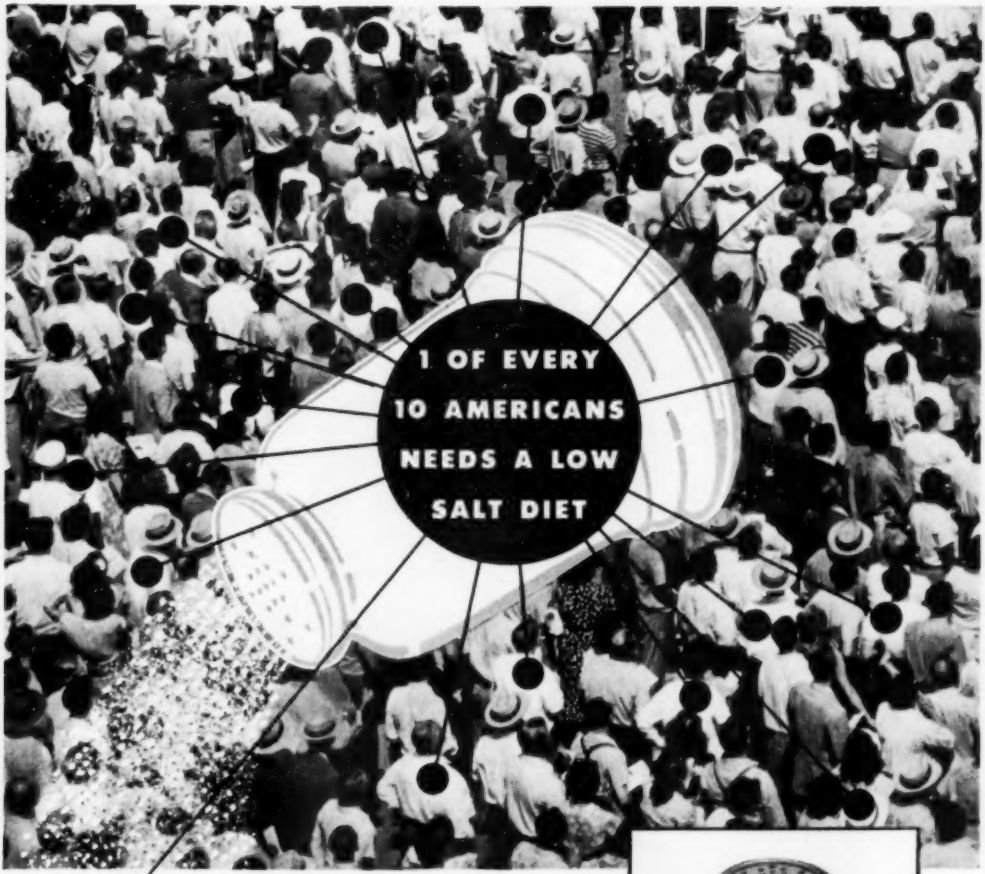
*Supplied as potassium iodide, dicalcium phosphate, sodium molybdate and the sulfates of manganese, cobalt, potassium, iron, copper, zinc and magnesium.

ABDOL With MINERALS Capsules are supplied in bottles of 100 and 250.

MEDICAMENTA VERA

Parke, Davis & Company

DETROIT, MICHIGAN



Neocurtasal tastes like, looks like, is used like table salt

More than 16,000,000 people comprise the huge market for sodium free salt. That's the estimate on Americans suffering from cardiac failure, renal disease, hypertension, arteriosclerosis, pregnancy complications and other conditions in which doctors order "no salt!"

And for years the physician's choice has been Neocurtasal. For this salt without sodium adds tang and zest to salt-free diets, helps to keep patients happy by making meals tasty.

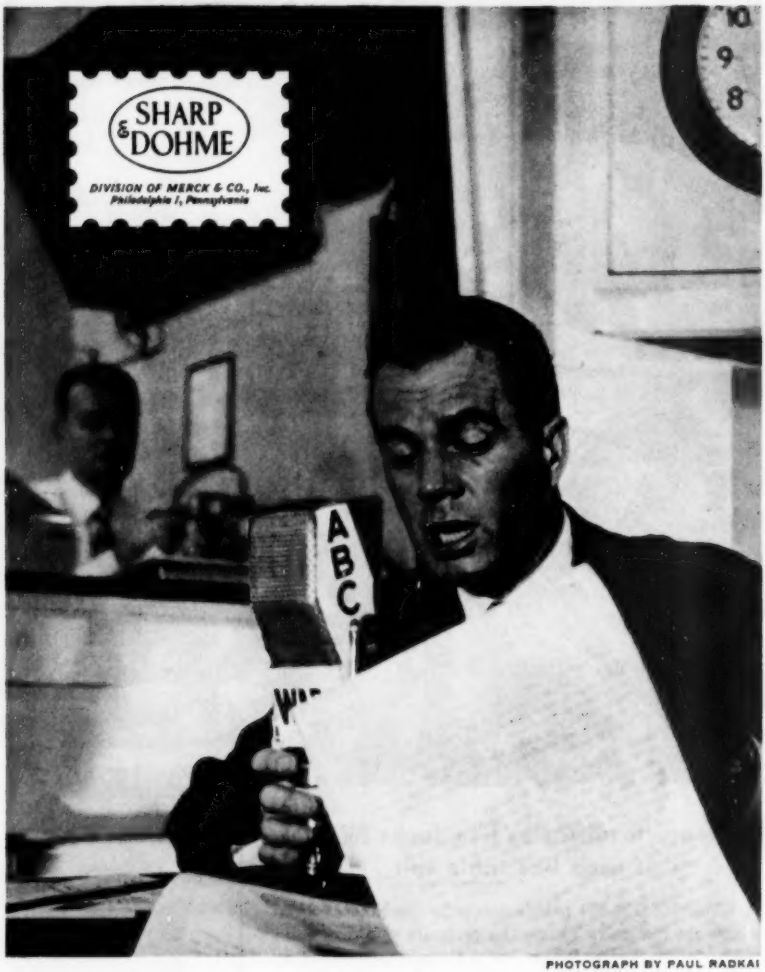
Saturation detailing and sampling, strong professional advertising will be sending more and more Neocurtasal prescriptions your way. Check stocks now. *Order Today* ... from your wholesaler. Keep full stocks on Neocurtasal.

SOLD ONLY THROUGH DRUG STORES

WINTHROP

Neocurtasal®

Winthrop-Stearns INC
1450 Broadway, New York 18, N. Y.
PHARMACEUTICALS IN DAILY DEMAND
ETHICALLY ADVERTISED AND DETAILED



PHOTOGRAPH BY PAUL RADKAI

My throat is my fortune—when it's sore I take

TYROZETS®

ANTIBIOTIC-ANESTHETIC THROAT LOZENGES

Not only million dollar throats need TYROZETS. You can convert many of your customers to this highly effective—and highly profitable—throat lozenge. People are willing to pay for antibiotic-anesthetic sore throat relief.

Tyrozets contain 1 mg. tyrothricin (potent topical antibiotic) and 5 mg. benzocaine (potent topical anesthetic). Vial of 12 retails at 75¢ and *you make 30¢ profit.*

Display Tyrozets on your quick-sell rack. They will win you new sales and higher profits, too.

AMERICAN JOURNAL OF PHARMACY

AND THE SCIENCES SUPPORTING PUBLIC HEALTH

Since 1825

LINWOOD F. TICE, Ph. G., M. Sc., D. Sc., Editor
Kenneth Avis, M. Sc., Editorial Assistant
Charles E. Welch, Jr., B. S., M. A., Editorial Assistant
John E. Kramer, B. Sc., Business Manager

COMMITTEE ON PUBLICATION

E. Fullerton Cook, P. D., Ph. M., D. Sc., Chairman
Mitchell Bernstein, P. D., M. D., F. A. C. P.
Marin S. Dunn, A. M., Ph. D.
Louis Gershenfeld, P. D., Ph. M., D. Sc.
Joseph W. E. Harrisson, P. D., Sc. D.
Ivor Griffith, P. D., Ph. M., D. Sc., F. R. S. A., ex officio

Vol. 126 OCTOBER 1954 No. 10

CONTENTS

Editorial

A New Approach in Neuropsychiatry? 324

Articles

Animal Experiments With Anticancer Agents 1952. By J. R. Sampey 326

The Prescription File and Journal of the Daniel B. Smith Pharmacy 1822-23. By G. Griffenhagen 344

Look Twice. By W. P. Briggs 336

Selected Abstracts 353

EDITORIAL

A NEW APPROACH IN NEUROPSYCHIATRY?

BOTH chlorpromazine and rauwolfia alkaloids offer most exciting possibilities in a field which is almost barren from the pharmacological standpoint.

While mental disease has increased alarmingly over the years and promises to continue on the increase, little advance has been made along therapeutic lines involving drugs. Of course sedatives and central nervous stimulants have a certain place as do Metrazol and insulin in shock therapy but these drugs have long been used and little remains to be learned about their indications and value.

Chlorpromazine, although originally introduced in this country as an anti-nausea drug, was soon found to possess actions far transcending this in importance. Its apparent action on the hypothalamus dulling all the usual emotional reactions to external and internal stimuli gives it almost unbelievable possibilities.

Rauwolfia was actually used for centuries in India as a tranquillizing agent. Although it has value in mild hypertension alone, and in more pronounced cases combined with other drugs, its effect on the hypothalamus is receiving considerable attention. Some recent reports have praised it highly as a means of quieting and controlling agitated or combative mental patients. Chlorpromazine is used even more commonly, today, for the same purpose. Some mental hospitals have been able to show a direct and profound relationship between the reduction in torn linens and bedding and the institution of therapy with these drugs.

The tranquillizing effect of rauwolfia and chlorpromazine is of course of great value in itself but many central nervous depressants will accomplish this. The thing which makes these drugs unique is that they do not produce a stupor as do the barbiturates, for example. Patients respond to questions lucidly with little or no diminution of intelligence or slurring of speech. This offers the possibility of psychiatric therapy in patients previously entirely refractory to treatment since the therapist could not get through to the patient. Already some early reports give promise of the value of this method. Possibly the greatest value of these developments is on the attitude of researchers in the field of neuropsychiatry. For years it has been the

consensus that mental disease was unlike all others in that drugs could play only an inconsequential role in therapy. While chlorpromazine and rauwolfia may not be the final answer they at least will serve to broaden the perspective of the specialists in this field.

A similar situation, but in reverse, is seen in the case of lysergic acid, long known as a component of ergot alkaloids, and recently synthesized. Lysergic acid in normal individuals produces bizarre mental aberrations and disorientations simulating those seen in certain mental disorders. The usefulness of this tool cannot yet be evaluated but it suggests the possibility that, although stress and life situations may be the underlying causes of mental diseases, they may be mediated by a chemical agent. If so, is it possible to block its action by some antimetabolite or protective substance? Is it possible that this explains why two persons exposed to the same conditions of environment, training, etc., react differently, one remaining mentally balanced and the other schizophrenic?

Every member of civilized society has reason to be concerned with these new horizons. Our technology makes increasing demands on our emotional reserve for we live not as man the animal once lived but with all sorts of restrictions, limitations and taboos. No longer can we dissipate tension, anxiety or hatred by appropriate physical pursuits and so these emotions become turned against our inner selves with terrible consequences. The rise in mental disease continues unabated so it is indeed hopeful when even the slightest evidence of a possible new approach is offered.

The eventual destruction of human civilization is not as farfetched and ridiculous as the incurable optimists would have us believe or as certain as the confirmed pessimists consider it to be. The seeds for its possible destruction are indeed planted in thermonuclear weapons, increasing materialism, and growing insanity—to name but a few. It will take all of man's ingenuity in coming years to make sure that these seeds do not mature with all their bitter fruit.

L. F. Tice

ANIMAL EXPERIMENTS WITH ANTICANCER AGENTS, 1952

By John R. Sampey *

RECENT surveys have been made by the author on animal experiments with anticancer agents for the three years, 1949-51 (99, 100, 101). The present study covers 122 articles on animal experiments published during 1952.

Two of the most comprehensive releases on the screening of substances for anticancer activity during 1952 were those of Shear (107) and Stock (111). The former listed 3,000 chemicals tested on Sarcoma 37 in mice, and the latter 8,000 chemicals tested against Sarcoma 180 in mice.

I. Inorganic Agents

Radiogold. Goldie et al. (40), prolonged the survival time of leukemic mice with intravenous injections of colloidal Au^{198}. Combined with aminopterin given intraperitoneally it showed a synergistic effect. The same authors (41) disintegrated S-37, S-180 and carcinoma cells in mice by intrapleural injections of radiogold. Myers and Colmery (88) treated mice successfully with adenocarcinoma, spindle-cell carcinoma, S-37 and lymphosarcoma by implants of the isotope. Radiogold also retarded ascites tumor in mice (119).

Radiolanthanum. Lewin, et al. (70), found radiolanthanum, La^{140} more effective than La^{139} in treating mice with Ehrlich ascites tumor.

Radiogallium. Ga^{67} and Ga^{72} were used against sarcomata (14).

Radioastatine. Brunner (14) employed At^{211} against thyroid cancer.

Arsenic. Beck (6) damaged lymphomas and melanomas in mice with subcutaneous injections of arsenites. Leiter, et al. (66), damaged S-37 in mice with subcutaneous injections of both trivalent and pentavalent arsenicals. Engle, et al. (28), reported leukemic mice showed improvement when treated intraperitoneally with several arsenicals.

* Professor of Chemistry, Furman University, Greenville, S. C.

Cyanate and Thiocyanate. Intraperitoneal injections of cyanate and isocyanate induced mitosis in mouse ascites carcinoma (7).

Manganese. Holtkamp, et al. (51), noted regression of fibrosarcoma in rats fed manganese.

Hydrogen Peroxide. Hollcroft, et al. (49), hastened tumor regression in mice by intravenous injections of H_2O_2 immediately before x-irradiation.

II. Organic Nitrogen Compounds

Nitrogen Mustards. Nitrogen mustards have continued to demand the attention of investigators seeking anticancer agents among organic nitrogen compounds. HN2 administered intraperitoneally caused Walker carcinoma to regress in rats (60, 91). Pecznik (91) reported HN3 more effective than HN2 or triethylene melamine on S-37, and that both HN2 and HN3 were as effective when given orally as when injected intraperitoneally. Sugiura and Stock (112, 114) found these two mustards effective against a number of types of neoplasms in rats and mice. Yoshida (122) caused regression of Yoshida sarcoma in rats by intraperitoneal treatment with HN2 oxide. Kobayshi (59) recorded negative results in tests of mustards on tumors.

Phosphoramides. A number of phosphoramides (SK3818, SK4614, SK5623) have proved effective against leukemia, S-180, S-231, edenocarcinoma, etc. (17, 21, 92, 110, 114) in mice and rats.

Ethylenimines and Triazines. Crossley, et al. (22), reported that 2,4,6-triethylenimino-s-triazine (TEM) given rats intraperitoneally caused complete regression in 70% of the animals with Flexner-Jobling carcinomas. Luhrs and Willis (76) retarded Jensen sarcoma in rats with TEM, and Sugiura and Stock (113) induced complete regressions of sarcomas and carcinomas in rodents with this triazine. Buckley, et al. (15), found 8 ethylenimines effective against S-180, and Personeus, et al. (92), employed a series of ethylenimines against breast cancer in rats. Walpole (118) used rat Walker C-256 to screen these nitrogen organic compounds.

Pyrimidines. Several substituted pyrimidines have proven useful against mouse leukemia and S-180 (16, 20, 24). Hendry and Homer (46) reported that some aziridinopyrimidines inhibited Walker C-256.

Ethylene Amines. Williams, et al. (120), reported a series of ethylene amines which were inhibitory to leukemia in rodents.

Guanazola. 8-Azaguanine has proved effective against mouse mammary carcinoma 755, either alone (4), or in combination with stilbestrol (103), or flavotin (37). Shapiro successfully treated mouse mammary cancer with a combination of guanazola and riboflavin (105), or guanazola and diethylstilbestrol (104). Goldin, et al. (42), noted the synergistic action of guanazola with alpha-peltation, and aminopterin against a transplanted mouse leukemia. Law, et al. (64), described similar results with a combination of amethopterin and azaguanine. Shapiro (106) also found that 6-formylpteridine augmented the inhibitory action of azaguanine against mouse breast carcinoma. Malmgren, et al. (77), depressed antibody formation in mice with lymphoma, breast tumor, S-37 and S-180 by means of guanazola.

Azo Compounds. S-37 and Walker carcinoma have been inhibited by azo compounds given intraperitoneally in rodents (102). Richardson, et al. (95), inhibited liver tumors in rats with simultaneous doses of methylcholanthrene and 3'-methyl-4-dimethylaminoazobenzene. Salzberg and Griffin (98) reduced tumor incidence in rats made diabetic by alloxan injections, and then fed 3'-methyldimethylaminoazobenzene. Cutting, et al. (23), inhibited spontaneous breast cancer in mice with p-aminoazobenzene.

Isoalloxazines. Holly, et al. (50), induced regression of lymphosarcoma implants in mice with this agent.

Thiouracil. Pellets of thiouracil subcutaneously in rats retarded AAF-induced cancer of the liver (90).

Thiazines. Farber, et al. (29), reported that dihydrothiazines significantly affected S-180 and both lymphotic and myelogenous leukemia in mice.

Hydrazines. Hydrazines were ineffective against mouse leukemia, C-1498 (35).

Malononitriles. Gal, et al. (38), noted that several malononitriles retarded the growth of transplanted carcinoma and sarcoma in mice.

Thyroxine. Simultaneous subcutaneous injections of dibenzanthracene and thyroxine lowered the carcinogenic properties of the hydrocarbon (5).

Epinephrine. Lettre, et al. (69), inhibited fibroblasts but not mouse ascites tumors with epinephrine.

III. Folic Acid Antagonists and Analogs

Law (64, 65) reported that the folic acid antagonist, amethopterin, was effective against mouse leukemia, and several investigators (10, 31, 34) used the same agent to regress S-37, S-180 and lymphosarcoma in mice. Ringsted (96) delayed the induction time of Rous sarcoma in chicks with aminopterin, but not the growth or number of tumors. Goldie, et al. (40), prolonged the lives of leukemic mice with aminopterin. Goldin, et al. (42), described the synergistic effect of guanazola and aminopterin against transplantable leukemia in mice. Williams (121) studied the action of folic antagonists on S-180 and leukemia in mice. Stock (111) listed 6 amino-folic acid analogs as strongly affecting S-180 in mice.

IV. Hormones

Cortisone. Cortisone was used extensively against neoplasms in 1952. It inhibited mammary carcinoma in mice (43, 79), mast cell tumors in dogs (12), forestomach papillomas in rats (18), transplanted rhabdomyosarcoma in mice (47), lymphoid tumors in chicks (63), and Walker tumors in rats (115). Foley (32) recorded that cortisone did not prevent the growth of lymphosarcoma in mice. Agosin, et al (2), caused metastases in adenocarcinoma in mice by intramuscular injections of the hormone. Cortisone given subcutaneously caused metastases in the abdomen, pancreas, etc. of mice if lyophilized injections of S-1 were given before the implantation of S-1 grafts (78).

ACTH. ACTH induced regression of induced leukemia in mice (11), and of lymphoid tumors in chicks (63).

Estrogens. Agnew and Gardner (1) prevented occurrence of spontaneous hepatomas in mice by injections of estrogens. Shapiro (103) inhibited mammary adenocarcinoma 755 in mice with stilbestrol. This same investigator (104) used diethylstilbestrol also to inhibit breast carcinoma in mice. This latter estrogen also retarded mammary fibroadenoma in rats (81).

Androgens. Monsen (83) prevented the occurrence of adrenal arterial lymphomas in mice with testosterone. This hormone also inhibited lymphomas in mice after irradiation (55).

Adrenal Extracts. Brownell, et al. (13), caused regression of S-37 in mice by intraperitoneal injections of adrenal extracts.

V. Miscellaneous

Hydrocarbons. The anticancer action of hydrocarbons continued to challenge investigators in 1952. Hill, et al. (48) studied the inhibition of mixtures of strong carcinogens. Painting mice with mixtures of dimethylbenzanthracene, dibenzanthracene, benzopyrene or methylcholanthrene resulted in tumors having a latent period longer than by DBA alone. These investigators also inhibited DBA tumors in mice by painting with 8-methyl-1,2-benzanthracene (109). Richardson, et al. (95), inhibited liver tumors in rats induced by feeding 3'methyl-4-dimethylaminoazobenzene by the administration of MC. Miller, et al. (82), retarded azo dye carcinogenesis by feeding rats MC, benzopyrene, DBA or benzanthracene.

Viruses. Koprowski, et al. (61, 62, 75), destroyed Ehrlich ascites in mice by intraperitoneal injections of Bunyamwera virus. They also retarded these tumors with West Nile virus. Moore, et al. (85, 86), studied the inhibition of Ehrlich ascites tumor and S-180 by Newcastle Disease virus. Moore (84) also destroyed S-180 in mice by Russian encephalitis, West Nile virus, St. Louis virus, etc. PR-8-Influenza virus inhibited ascites tumor in mice,[57] and Egypt 101 virus inhibited transplanted tumors in rats (117). Ginder and Friedwald (39) reduced 100% mortality to 62% by intramuscular injections of Semliki Forest virus on rabbit myxoma.

Cells. Snell (108) inhibited the growth of homoiotransplants in mice by pretreatment with lyophilized C1498 and leukemic tissues. Kaliss (53) also retarded homoiografts by pretreatment with lyophilized tissue injections. Nigrelli (89) decreased S-180 in mice by subcutaneous injections of suspensions of "pink gland" from seacucumbers. Kaliss (54) recorded that prior injection of guinea pig kidney tissue or spleen in mice failed to abolish the resistance of the animals to tumor homiografts. This worker also recorded (55) that small injections of lympholized tissues of mouse tumors or normal tissues in mice retarded tumor grafts, but that large injections enhanced growth of the grafts. Foley has conducted several studies on the anticancer action of spleen tissue. Subcutaneously in mice it inhibited the growth of lymphosarcoma (30, 31, 32, 33). Ellis and

Kidd (25) implanted spleen cells in the muscles of rabbits to retard the growth of Brown-Pearce carcinoma.

Sarcoma 180. Antopol, et al. (4), and Graff, et al. (44), delayed the growth of adenocarcinoma 755 in mice with S-180.

Aspergillus Fumigatus. Injections of purified extracts inhibited S-180 in mice (93).

E. Coli. S-180 in mice also regressed by intraperitoneal injections of aqueous solutions of *E. coli* (52).

Plant Extracts. Belkin, et al. (8, 9), studied the tumor damaging capacity of plant materials: they reported that extracts from 4 plants used as cathartics were damaging to S-37 in mice, and that 12 plant diuretics had the same effect.

Antibiotics. Chinn (19) recorded that terramycin, aureomycin, neomycin and antibiotic PA 96 mixed with Rous virus prevented sarcoma in chickens. Martinez, et al. (79), caused regression of tumors with terramycin.

Colchicines. Leiter, et al. (67, 68), listed more than 25 colchicines that damaged S-37 in mice.

Podophyllin. Intraperitoneal injections damaged S-37 (74).

Alpha-Peltation. Goldin, et al. (42), noted the synergistic action of alpha-peltation and guanazola, and alpha-peltation and aminopterin against leukemia in mice.

Pterins. Several pterins caused severe damage to Yoshida sarcoma in rats (97).

Thiosalicylic Acid. Harris and Clowes (45) noted that this chemical protected rats from DAB tumors.

Furans. Cutting, et al. (23), inhibited mammary tumors in mice by feeding furans. Freedlander, et al. (36), inhibited S-180 in mice with 4 furans.

Diet. Underfed mice showed longer survival and fewer breast tumors (116). Harris and Clowes (45) studied the inhibition of DAB tumors in mice on diets of 5% corn oil, 10% casein and 20% olive oil. Engel and Copeland (26) noted that natural foodstuffs protected rats against mammary tumors induced by AAF better than semipurified diets. They also found that a diet of 40-60%

casein caused marked reduction of mammary tumors induced by AAF (*27*). Phenylalanine in the diet of rats increased their resistance to implanted fibrosarcoma (*73*). An antigen from gelatin decreaesd benzopyrene tumors in mice from 80-90% to 20-30% (*80*). King (*58*) found that 8 months of restricted feeding of castrate mice failed to protect them against a high cancer incidence of mammary tumors.

Bacterial Polysaccharides. Algire, et al. (*3*), induced tumor damage in mice by intraperitoneal injections of bacterial polysaccharides.

BAL. Beck (*6*) noted that injections of BAL and arsenic in mice caused less damage to S-37 than arsenic alone.

Strangulation. Strangulation with a rubber tourniquet for as little as 16-20 hours induced atrophy of sarcoma and carcinoma in rats (*71*).

Viscera. Extracts of guinea pig viscera (*87*) caused tumor regression in rats.

Systemic Stress. Rashkis (*94*) reported that mice forced to swim had longer survival than those under no strain.

Low Temperature. Low outdoor temperatures inhibited skin tumors in rabbits painted with dimethylbenzanthracene (*72*).

Acknowledgments

The author is grateful for research grants from the American Association for the Advancement of Science and the South Carolina Academy of Science. The Army Medical Library and the Library of Furman University have made the original literature available.

REFERENCES

(1) Agnew, L. R. C. and Gardner, W. U., *Cancer Res. 12:*757-61 (1952).
(2) Agosin, M., et al., *Proc. Soc. Exptl. Biol. Med. 80:*128-31 (1952).
(3) Algire, G. H., et al., *J. Natl. Cancer Inst. 12:*1279-96 (1952).
(4) Antopol, W., et al., *Cancer Res. 12:*245 (1952).
(5) Bather, R. and Franks, W. R., *ibid. 12:*247-48 (1952).
(6) Beck, L. V., *J. Natl. Cancer Inst. 13:*619-25 (1952).
(7) Beickert, A., and Siering, H., *Z. Krebsforsch 58:*614-20 (1952).
(8) Belkin, M. and Fitzgerald, D. B., *J. Natl. Cancer Inst. 13:*139-56 (1952).

(9) Belkin, M., et al., *ibid. 13:*741-4 (1952).
(10) Bennette, J. G., *Brit. J. Cancer 6:*377-88 (1952).
(11) Block, M. and Takano, G., *Cancer Res. 12:*250-1 (1952).
(12) Boom, F., *Proc. Soc. Exptl. Biol. Med. 79:*651-4 (1952).
(13) Brownell, K. A., et al., *Biol. Bull. 102:*226-31 (1952).
(14) Bruner, H. D., *Nucleonics 10:*49-50 (1952).
(15) Buckley, S. M., et al., *Cancer 5:*144-52 (1952).
(16) Burchenal, J. H., et al., *Cancer Res. 12:*251 (1952).
(17) Burchenal, J. H., et al., *ibid. 12:*251-2 (1952).
(18) Cambel, P. and Ray, F. E., *ibid. 12:*252-3 (1952).
(19) Chinn, B. D., *Proc. Soc. Exptl. Biol. Med. 80:*359-60 (1952).
(20) Clarke, D. A., et al., *Cancer Res. 12:*255 (1952).
(21) Crossley, M. L., et al., *ibid. 12:*256 (1952).
(22) Crossley, M. L., et al., *Proc. Soc. Exptl. Biol. Med. 80:*452-5 (1952).
(23) Cutting, W. C., et al., *Stanford Med. Bull. 10:*304-7 (1952).
(24) Elion, G. B., et al., *Cancer Res. 12:*259 (1952).
(25) Ellis, J. T. and Kidd, J. G., *ibid. 12:*259 (1952).
(26) Engel, R. W. and Copeland, D. H., *ibid. 12:*211-5 (1952).
(27) Engel, R. W. and Copeland, D. H., *ibid. 12:*905-8 (1952).
(28) Engle, R. L. Jr., et al., *Proc. Soc. Exptl. Biol. Med. 80:*489-92 (1952).
(29) Farber, S., et al., *Am. J. Path. 28:*559 (1952).
(30) Foley, E. J., *Proc. Soc. Exptl. Biol. Med. 79:*150-5 (1952).
(31) Foley, E. J., *ibid. 79:*155-8 (1952).
(32) Foley, E. J., *ibid. 80:*669-71 (1952).
(33) Foley, E. J., *ibid. 80:*671-4 (1952).
(34) Foley, E. J., *ibid. 80:*675-7 (1952).
(35) Freedlander, B. L. and Furst, A., *ibid. 81:*638-40 (1952).
(36) Freedlander, B. L., et al., *Stanford Med. Bull. 10:*310-2 (1952).
(37) Fugmann, R. A. and Shapiro, D. M., *Cancer Res. 12:*263 (1952).
(38) Gal, E. M., et al., *ibid. 12:*565-72 (1952).
(39) Ginder, D. R. and Friedwald, W. F., *Proc. Soc. Exptl. Biol. Med. 79:*615-8 (1952).
(40) Goldie, H., et al., *Cancer Res. 12:*92-9 (1952).
(41) Goldie, H., et al., *Proc. Soc. Exptl. Biol. Med. 80:*327-31 (1952).
(42) Goldin, A., et al., *Cancer 5:*153-60 (1952).
(43) Gottschalk, R. G. and Grollman, A., *Cancer Res. 12:*651-3 (1952).
(44) Graff, S., et al., *ibid. 12:*383-4 (1952).
(45) Harris, P. N and Clowes, G. H. A., *ibid. 12:*471-9 (1952).
(46) Hendry, J. A. and Homer, R. F., *J. Chem. Soc. 1952:*328-33.
(47) Higgins, G. M. and Bennett, W. A., *J. Natl. Cancer Inst. 12:*851-9 (1952).
(48) Hill, W. T., et al., *Cancer Res. 12:*270 (1952).
(49) Hollcroft, J. W., et al., *J. Natl. Cancer Inst. 12:*751-63 (1952).
(50) Holly, F. W., et al., *J. Am. Chem. Soc. 74:*4047-8 (1952).
(51) Holtkamp, D. E., et al., *Proc. Soc. Exptl. Biol. Med. 80:*395-7 (1952).
(52) Ikawa, M., et al., *J. Natl. Cancer Inst. 13:*157-66 (1952).

(53) Kaliss, N., *Cancer Res. 12:*379-82 (1952).
(54) Kaliss, N., *Science 116:*279-80 (1952).
(55) Kaliss., N., *Cancer Res. 12:*379-82 (1952).
(56) Kaplan, H. S. and Broun, M. B., *ibid. 12:*445-7 (1952).
(57) Kausche, G. A., et al., *Z. Naturforsch. 7b:*33-6 (1952).
(58) King, J. T., *Texas Repts. Biol. Med. 10:*1023-7 (1952).
(59) Kobayshi, Y., *Gann. 42:*274-5 (1952).
(60) Koller, P. C. and Casarini, A., *Brit. J. Cancer 6:*173-85 (1952).
(61) Koprowska, I. and Koprowski, H., *Fed. Proc. 11:*420 (1952).
(62) Koprowska, I. and Koprowski, H., *Cancer Res. 13:*651-60 (1953).
(63) Lannek, N., *Brit. J. Cancer 6:*369-76 (1952).
(64) Law, L. W., *Cancer Res. 12:*871-8 (1952).
(65) Law, L. W., *Nature 169:*628-9 (1952).
(66) Leiter, J., et al., *J. Natl. Cancer Inst. 13:*365-78 (1952).
(67) Leiter, J., et al., *ibid. 13:*379-92 (1952).
(68) Leiter, J., et al., *ibid. 13:*731-9 (1952).
(69) Lettre, H., *Z. Physiol. Chem. 291:*99-103 (1952).
(70) Lewin, R., et al., *Cancer Res. 12:*278-9 (1952).
(71) Lewis, M. R. and Aptekman, P. M., *Cancer 5:*411-3 (1952).
(73) Loefer, J. B. and Mefferd, R. B. Jr,, *Texas Repts-Biol. Med. 10:*614-8 (1952).
(74) Loran, M. R. and Towbin, A., *Cancer Res. 12:*279-80 (1952).
(75) Love, R. and Koprowski, H., *Fed. Proc. 11:*421 (1952).
(72) Linell, F. and Norden, J. G., *Acta Path. Microbiol. Scand. 31:*492-500 (1952).
(76) Luhrs, H. and Willis, H., *Dtsch. Gesundheitsw. 1952:*1537-41.
(77) Malmgren, R. A., et al., *J. Natl. Cancer Inst. 12:*807-18 (1952).
(78) Malomut, N., et al., *Proc. Natl. Acad. Sci. 38:*991-5 (1952).
(79) Martinez, C., *Proc. Soc. Exptl. Biol. Med. 80:*81-3 (1952).
(80) Micheel, F., et al., *Hoppe-Seylers Zettschr. Physiol. Chem. 291:*153-4 (1952).
(81) Millar, M. J. and Noble, R. L., *Cancer Res. 12:*282 (1952).
(82) Miller, E. C., et al., *ibid. 12:*282-3 (1952).
(83) Monsen, H., *ibid. 12:*284-5 (1952).
(84) Moore, A. E., *Ann. New York Acad. Sci. 54:*945-52 (1952).
(85) Moore, A. E. and Diamond, L. C., *Proc. Soc. Exptl. Biol. Med. 79:*663-9 (1952).
(86) Moore, A. E., et al., *ibid. 82:*498-501 (1952).
(87) Mosinger, M., *Bull. Assoc. France, Etude Cancer 37:*295-323 (1952).
(88) Myers, W. G. and Colmery, B. H., *Cancer Res. 12:*285-6 (1952).
(89) Nigrelli, R. F., *Zoologica 37:*89-90 (1952).
(90) Pashkis, K. E., et al., *Cancer Res. 12:*286-7 (1952).
(91) Peczenik, O., *Brit. J. Cancer 6:*262-9 (1952).
(92) Personeus, G., et al., *Proc. Soc. Exptl. Biol. Med. 82:*614-6 (1952).
(93) Petermann, M. L., et al., *Arch. Biochem. and Biophysics 37:*117-30 (1952).
(94) Rashkis, H. A., *Science 116:*169-71 (1952).

(95) Richardson, H. L., et al., *Cancer Res. 12:*356-61 (1952).
(96) Ringsted, J., *Acta Path. Microbiol. Scand. 31:*275-80 (1952).
(97) Sakurai, Y. and Yoshino, K., *J. Pharm. Soc. Japan 72:*1204-6 (1952).
(98) Salzberg, D. A. and Griffin, A. C., *Cancer Res. 12:*294 (1952).
(99) Sampey, J. R., *Furman Studies 35, No. 3:*18-36 (1952).
(100) Sampey, J. R., *Ind. Med. and Surg. 23:*159-60 (1954).
(101) Sampey, J. R., *In Press. Furman Studies.*
(102) Seligman, A. M., et al., *Cancer 5:*613-9 (1952).
(103) Shapiro, D. M., *Cancer Res. 12:*295-6 (1952).
(104) Shapiro, D. M., *ibid. 12:*713-5 (1952).
(105) Shapiro, D. M. and Fugmann, R. A., *Proc. Soc. Exptl. Biol. Med. 81:*239-42 (1952).
(106) Shapiro, D. M., et al., *ibid. 81:*616-9 (1952).
(107) Shear, M. J., *Am. Chem. Soc. Meeting Abstracts 1952:* p. 9L.
(108) Snell, G. D., *J. Natl. Cancer Inst. 13:*719-29 (1952).
(109) Stanger, D. W., et al., *Cancer Res. 12:299* (1952).
(110) Stock, C. C., et al., *ibid. 12:*300 (1952).
(111) Stock, C. C., *Am. Chem. Soc. Meeting Abstracts 1952:* p. 8L.
(112) Sugiura, K. and Stock, C. C., *Cancer 5:*382-402 (1952).
(113) Sugiura, K. and Stock, C. C., *ibid. 979-91 (1952).*
(114) Sugiura, K. and Stock, *C. C. Cancer Res. 12:*300-1 (1952).
(115) Talalay, R., et al., *ibid. 12:*302 (1952).
(116) Tannenbaum, A. and Silverstone, H., *ibid. 12:*302 (1952).
(117) Toolan, H. W. and Moore, A. E., *Proc. Soc. Exptl. Biol. Med. 79:*697-702 (1952).
(118) Walpole, A. L., *Am. Chem. Soc. Meeting Abstracts 1952:* p. 8L-9L.
(119) Williams, G. Z. and Williams, J. T., *Cancer Res. 12:*309-10 (1952).
(120) Williams, J. H., et al., *ibid. 12:*310 (1952).
(121) Williams, J. H., *Blood (Suppl.) 1952:*100-7.
(122) Yoshida, T., *J. Natl. Cancer Inst. 12:*947-62 (1952).

LOOK TWICE *

By W. Paul Briggs **

MY assignment to discuss recruitment for the profession seems to present at least three distinct considerations. One, the attitudes of pharmacists toward pharmacy; two, recognition of the interests and problems of youth; and three, the presentation of our story so as to stimulate the imagination and invite potential students to seek detailed information about pharmacy.

Recruitment, through career guidance, is basically a selling program. Selling is one of the truly progressive and constructive arts. Salesmen have done much to develop and advance the full and comfortable American way of life. Indeed it is the salesman that has taught us to enjoy the benefits flowing from the creative and productive genius of America. Your automobile, electric lights, television, air conditioning, effective drugs, are yours because good salesmen—in their role of teachers—taught the people to want, use and demand these modern blessings. Without selling, most of our common place, everyday comforts and conveniences would still be only laboratory curiosities.

We will ring our church bells next Sunday, just as has been done every Sunday for 2,000 years. Tomorrow we will raise the stars and stripes, salute and honor it, just as we have raised that flag every morning since 1776. Just because we believe devoutly in our churches and our nation, we do not neglect to ring the bells and hoist the flag as self-reminders of the glories of God and our country.

Perhaps there is a lesson here for pharmacists. We are a restless and vigorous people and it is likely that very few men of intellect, spirit and ambition are wholly satisfied with their status. But it seems to me that too many pharmacists continually minimize their chosen field, and dwell unduly upon the problems of pharmacy—as if every field of life work did not have fully comparable difficulties.

Truly, pharmacy has been good to most of us. We, in turn, have been privileged to aid our fellow man in direct and helpful ways enjoyed by few others in their daily work.

It therefore seems to me that the first consideration by pharmacists, as they embark upon a program of recruitment for the pro-

* Presented at the Annual Refresher Course at the University of Texas, Austin, Texas, September 30, 1954.

** Executive Director, American Foundation for Pharmaceutical Education.

fession, is to reconsider their own rewards from pharmacy. If, by honest, objective appraisal, any pharmacist cannot tally his total benefits high above the transient problems of pharmacy, it is likely that his failure and frustration is of his own making. Effective ambassadors will not be found among the disheartened and defeated.

I am not a naive Pollyanna, but neither am I a pharmacy-mortician. How do you know you would be better off in some other occupation? Do you really know the problems faced by physicians, by teachers, by salesmen, by plumbers, by lawyers, by farmers, by any other vocation beside pharmacy? But you do know your own benefits, and they are many. Before you plan to tell the story of pharmacy to eager and courageous youths, count the plus values of pharmacy. Add up your own gains. Look twice at pharmacy. Only then will you be ready to be a missionary for pharmacy.

Next, our recruitment plans must be geared to the interests, problems and natural apprehensions of young people.

You and I devote too much time in looking over our shoulders at the past. Youth is looking forward to the future. If young men and women knew with certainty of the tragedies and conflicts that will overtake them, civilization would come to a standstill. Caution comes with age—courage is the hallmark of youth. Youth moves rapidly, fighting for opportunity and success—age moves slowly in knowledge of difficulties and in fear of failure.

Potential recruits to pharmacy want to know of the opportunities open to them—not about the difficulties. Their ambition will carry them into the opportunities. They can get a superficial view of the practice of pharmacy in their own backyard—what they want to hear from us is the rest of the story of pharmacy. They want to know what lies behind the drug store, and of the scores and scores of other types of work that collectively make up the great world of pharmacy. We should reveal the living drama of pharmacy—the vital story of a dynamic profession, geared to the speed, courage and ambition of youth.

Look twice at youth and you will know that their interests are different from yours. Later, as students, they may thrill to the glory of the history of pharmacy. But right now they want to know how they can make their own personal history with a rewarding career in pharmacy. Youth wants a report on pharmacy today, and a reasonable estimate of what tomorrow will offer.

You can be entirely truthful and still "hitch their wagon to a star." Youth wants to know how far it can go, rather than about the frustrations of tired spirits. The disconcerting problems and limitations that we see may not even exist in 5 years. Moreover, the drive of young, well-trained pharmacists of the future may conquer the problems that have been so baffling to our generation. Look twice at youth—and plan your story for their eager, fearless, rushing outlook. And always remember that good selling first creates desire—and only then closes the sale with the details and price.

Finally, what of the story itself? In my view, high school seniors, junior college students, and even parents might best be attracted to pharmacy through a two-phase treatment. Phase One would be the sweeping, all inclusive "buckshot" approach. Phase Two, the selective and carefully aimed "rifle shot" approach. From experience we know that pharmacy annually attracts a certain number of students even without any broad, formal recruitment effort. Our first shot then, in a planned recruitment campaign, should be directed toward every man and woman without respect to their known interest in pharmacy.

It is distressing, indeed a bit frightening, to see the large number of freshmen who enter universities every year without the faintest motivation toward any special field of study or plans for following any life career. Often this is due to a lack of knowledge of the various careers that hungrily beckon to qualified young men and women. This is a serious charge against educational leadership and against every one of the professions, including our own. Obviously, here is our most fertile field for helpfulness and for strengthening the professional manpower of pharmacy.

The splendid booklet, SHALL I STUDY PHARMACY?, expertly developed by the American Association of Colleges of Pharmacy gives authoritative and detailed information on the profession. It should have the widest possible distribution to interested young people and also to guidance counsellors, high school science teachers and librarians. This type of recruitment presentation is essential, and the profession is indebted to the College Association for preparing the booklet.

However, the very comprehensiveness of its coverage, may restrict effective "buckshot" distribution to masses of potential students. Judged by successful selling technics, our first approach should be directed to *every* superior man and woman of college calibre, with or

without known motivation for pharmacy. Only by such all embracive coverage can we find open-minded, outstanding men for pharmacy that we would not get except by introducing them to the opportunities in pharmacy and interesting them in careers in the profession.

Now, especially from here on, I trust you will keep in mind the fact that you invited me to talk with you about recruitment for the profession. Also, I would ask that you temporarily accept the Washington definition of an expert—"a man with a brief case, more than 100 miles from home." Since I am nearly 3,000 miles from home I will risk suggesting a type "buckshot" approach to recruitment that may be of some service to you. Of course, to be effective, any missionary work you do, as individuals or as an association, should always be backed up by selective distribution of the A.A.C.P. booklet, SHALL I STUDY PHARMACY?. This is important since it is usually impossible to hold any large and mixed audience long enough to give all the details of the study of pharmacy; the practice of pharmacy; and the whole drug world in one talk.

Accordingly, I would suggest that high school classes, junior college orientation sessions, parent and civic groups, etc., first be addressed on pharmacy in broad, sweeping descriptions. You can supply specific details later to those in whom a positive "buying" interest has been created. Let me briefly illustrate what I mean by Phase One—the "buckshot" approach. I think I would address such non-pharmacy groups about our profession in the following manner.

Pharmacy is older than recorded history, and it is as young and virile as tomorrow's research and the health needs of the people. It is big business and an indispensable profession. Pharmacy pays cash dividends proportional to personal investment; and life satisfaction, proportional to life contributions. Pharmacy has a great deal to offer you, provided you offer something to pharmacy.

Pharmacy is not *just* the familiar, friendly drug store; or *just* the essential distributive functions of the wholesale druggist; or *just* the vast pharmaceutical manufacturing plants; or *just* the creative research laboratories; or *just* the therapeutic storehouse of the hospital; or *just* military and government pharmacy services; or *just* colleges; or *just* scores of other less obvious activities. Pharmacy, in its broadest meaning is the bridge between knowledge and health.

Pharmacy ranks in national importance with agriculture, medicine, home building and communication. It is an essential service for all the people.

No other profession, and probably no other vocation, presents so many and varied opportunities and challenges to the youth of America. In pharmacy there are needs for practically every ability and interest that young men and women could possess or acquire.

How do pharmacists start their careers? Some dispense prescriptions or perform over-all activities in a drug store; others travel as a drug or wholesale salesman; many serve in the Army, Navy, Air Force, Public Health, Veterans Administration; others may be narcotic inspectors; analysts in a federal or state food and drug laboratory.

With broadened qualifications, pharmacists may do research; manage a business; seek new drugs in the fields or laboratories; buy drugs or merchandise; do organizational work; design advertising; manufacture chemicals; drugs, or cosmetics; be salesmanagers; trade association executives; develop new drug products or control their purity and quality.

Still others market products of their own manufacture; call upon physicians; serve in the growing field of veterinary medicine; work in various departments of the Federal Government; write for drug journals; carry on product and market research; travel abroad as foreign representatives; administer clinical research studies; serve as state board of pharmacy examiners or inspectors.

Nearly 45,000 pharmacists operate their own drug stores. Pharmacists are employed as hospital superintendents; as editors; and in public and trade relations work. A few are presidents of great drug corporations. Every pharmacist can help his fellow man; live a full, interesting and productive life; and do these jobs at a salary rate that compares favorably with other professions and vocations.

The services of pharmacy are dispersed into every hamlet in the country, requiring a professional personnel strength of about 105,000 men and women. Millions of people go into the 53,000 drug stores of the nation every week. Pharmacies supplied nearly 500 million prescriptions to our people last year. Drug store sales in 1953 were well over 4 billion dollars. It requires the facilities of 74 colleges and over 850 teachers to train the average enrollment of 17,000 pharmacy students.

Pharmacies are operated in most of the more than 6,000 hospitals of the nation, serving over 1½ million bed patients. There are about a thousand drug manufacturers, from tiny to Titanic, and about 300 wholesale drug houses supply drugs and merchandise to retail pharmacy. The business and profession of pharmacy is served by nearly 100 technical and trade journals. All of these activities require the services of pharmacists.

Approximately 80,000 pharmacists are engaged in professional and retailing services to the public, and the remaining 25,000 are distributed throughout the drug and chemical industries, wholesale trade, colleges, government services and miscellaneous but related activities.

Since 1932, colleges of pharmacy have all required a minimum 4-year course leading to the degree of Bachelor of Science. The educational requirement for entrance to the profession will be advanced to a total of 5 years in collegiate study, beginning in 1960.

There is a rich future ahead for those who elect the profession of pharmacy as a life work—and who are prepared to work at their life.

What income do pharmacists receive? The very diversity of activity in pharmacy provides salary ranges from $100 per week to upward of $50,000 per year, and at every level in between. However, using retail practice as a starting point, today's typical salary is probably in excess of $100 per week for a normal work week. This varies in different communities and in different sections of the country, but does not drop below $85 at any point, and certainly rises to more than $135 in some sections. If you will compare this immediate earning power in pharmacy with that prevailing in practically every other field of endeavor, you will be pleasantly surprised to learn that the newly registered pharmacist, in almost every instance, receives one of the highest starting salaries available to college graduates today. Drug store owners, executives and other positions open to qualified and experienced men, of course, offer even higher rewards. Progress in type of work, in responsibility, in privilege, as well as in salary, is dependent upon personal growth, ambition, and attention to duty. There is no ceiling on the compensation of the pharmacist who rises to the opportunities available.

What about hours of work and vacations? It is correct to say that working conditions in pharmacy today, while not always true in the past, closely approximate the best conditions prevailing in all other fields of endeavor. Pharmacy has been steadily attracting an

increasing number of women and it offers many unusual opportunities for careers to properly qualified women.

I have not given you any text book definitions of pharmacy because I am sure you can find these for yourself. Obviously, pharmacy embraces all aspects of drugs; their discovery, development, production, distribution, therapeutic action, in fact, every phase of the building and maintenance of the "drug bridge" between knowledge and health.

In its unique position of a combined business and profession, pharmacy has many purely commercial, financial, legal and management aspects, not common in other fields of endeavor. As the manufacture of drugs has moved in the direction of large laboratories and factories, pharmacy has drawn upon other specialties such as engineering, personnel management, promotion, distribution, and finance. In this evolutionary process, wholly new combination fields have been opened for properly prepared pharmacists. Obviously those new areas of service have not lessened, but rather increased, the need of pharmacy for men trained at the graduate level in such technical disciplines as pharmaceutical chemistry, pharmacology, manufacturing pharmacy, and related sciences.

There is constant need for superior men for the practice of pharmacy. I anticipate that these needs will materially exceed the supply for many years to come. There is no simple formula by which a young man or woman can measure personal fitness for pharmacy. This is largely due to the fact that pharmacy, in its true and broadest meaning, embraces so many areas of activity, requiring and utilizing so many different talents and interests, that any intelligent, honest, motivated and industrious person can find a rewarding and agreeable niche within pharmacy.

In brief, pharmacy is good for those, who are good for pharmacy. Pharmacy holds out opportunities of almost endless variety, and it readily absorbs an endless variety of young men and women. A letter, or better still, a personal talk with the Dean of the ..... College of Pharmacy may show you the road to a happy choice of a career in the profession of pharmacy.

This is merely an outline for a "buckshot," Phase One, recruitment talk on pharmacy. If it can be of any use to you, you are certainly welcome to it. Of course, your address should be filled out with some local color and be adjusted to your audience.

Look twice at pharmacy—at the future of pharmacy—at your personal responsibilities to pharmacy.

Each of you should assume, as a moral obligation, the role of Recruitment Ambassador for pharmacy. You should volunteer your services to, and coordinate your efforts with, your Association and your Texas colleges. You should personally undertake to place in the hands of every superior, interested, potential pharmacist, a copy of SHALL I STUDY PHARMACY?. If you will do these things, pharmacy will not just have enough pharmacists tomorrow—it will have enough high calibre pharmacists to make the profession everything that it rightfully should be.

THE PRESCRIPTION FILE AND JOURNAL OF THE DANIEL B. SMITH PHARMACY, 1822-23

By George Griffenhagen *

DANIEL B. SMITH (1792-1883) is a name well known in American pharmaceutical history. Smith was founder and secretary of the Philadelphia College of Pharmacy from 1821-28; Vice President, 1828-29; and President from 1829-54. He was one of the principal sponsors and editor for many years of the *American Journal of Pharmacy* and he was founding member and the first president of the American Pharmaceutical Association, 1852-53.

Daniel B. Smith operated a drug store on High Street in Philadelphia as early as 1814. In 1822 he moved to Sixth and Mulberry Streets (now Sixth and Arch Streets), at this time a quiet, secluded, residential section.** In 1828, he entered into partnership with William Hodgson, Jr. as a wholesale drug firm, which in 1849 was sold to Charles Bullock and Edmund A. Crenshaw (1). Some excellent accounts of the Smith and Hodgson store have been recorded by William J. Jenks. Numerous other recollections of early Philadelphia pharmacists have been recorded, giving physical arrangements of the store, and the type of business carried on to the best of the recorder's memory (2). However, original records are usually more reliable than one's memory.

---

* Associate Curator, Division of Medicine and Public Health, Smithsonian Institution, Washington, D. C.

** Most biographies of Daniel B. Smith record that he opened his own drug store at the northeast corner of Sixth and Arch Streets, Philadelphia, in 1819. However, according to R. N. Williams, 2nd, Director of the Historical Society of Pennsylvania, Smith operated a drug store on High Street as early as 1814. The Philadelphia City Directory for 1822 listed the Daniel B. Smith drug store as being located on High Street, while the 1823 Philadelphia City Directory listed the Smith drug store as being located at the corner of Sixth and Mulberry Streets. It is probable that Daniel B. Smith moved to this address during the summer of 1822 just prior to starting the new records herein described.

Philadelphia Apothecary Shop from Richard Hazen's *The Panorama of Professions and Trades,* Phila., 1836. Photograph courtesy of the Smithsonian Institution.

Recently this author has had the privilege of carefully studying the original prescription file and journal of the Daniel B. Smith drug store for the years 1822 and 1823 which fortunately are still extant. From these two valuable sources, new light has been shed on the operation of what appears to have been a typical "corner neighborhood drug store" in a large metropolitan city of the period.

The prescription file is preserved in a bound book, measuring 7½ inches wide, 12½ inches tall and 2 inches thick. The prescriptions are pasted on the pages approximately 5 per page. Each prescription shows definite signs that they originally were hung on wire or a spindle, and that some time prior to affixing in the book, each prescription was cut down obviously to eliminate the dog-eared edges. The trimming destroyed a small portion of the actual writing on many

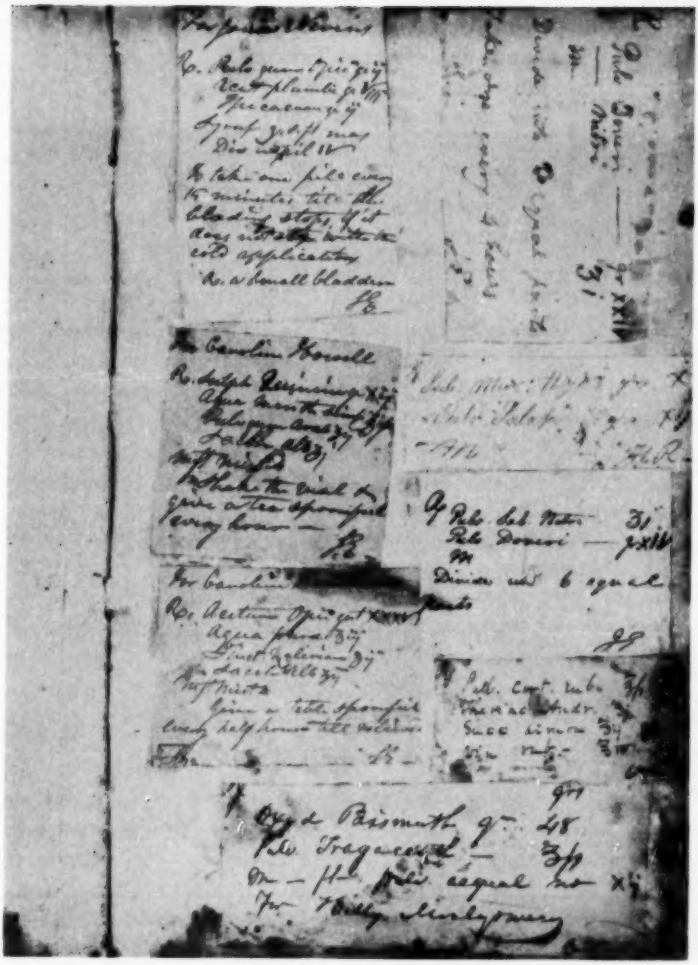
of the prescriptions. The file includes 804 prescriptions, the earliest of which dates December 10, 1822, and the last dating August 13, 1823. If this file represents all of the prescriptions handled by the Daniel B. Smith drug store during this period (and a comparison with the journal indicates that this is the case), then Smith filled on an average of 3¼ prescriptions per day, or 22¾ prescriptions per week. The journal further indicates that the store was opened for business every day including Sundays and holidays.

Each prescription, which was usually written in ink on plain pieces of white paper of various textures, carried the name of the patient at the top, followed by the prescription complete with dosage. The physician usually signed the prescription only with initials. One of the interesting features is the small quantity of medication which was usually prescribed. While occasionally pills and powders were prescribed in quantities up to 30 doses, the usual quantity was 12, even in cases where the dosage was "one every two hours." This required at times, a daily refill as evidenced by the journal. Liquids were usually prescribed by the "teaspoonful," the "tablespoonful," or the "wine glass full." Solutions, pills and powders were by far the most common dosage forms employed, with a nominal quantity of ointments, emplasters, and troches.

Some of the interesting notations made by physicians on the prescriptions include the following: "Will D. B. S. please put this up at mod(erate) price for a poor man," or "take two of these at once after having been blooded."

The Journal appears to be a standard book prepared and used in business of the period. It measures 6½ inches wide, 15 inches tall and ¾ inches thick. The first entry is dated August 1, 1822, and the last entry is dated March 24, 1823. Anywhere from 5 to 12 entries a day were customarily made, and in about one-half of the cases, the sales price was included. The names of Daniel B. Smith and Joseph Roberts appear on the fly leaf.

While deterioration of the prescription file, along with the problem of separating multiple combinations, prevented an exact accounting of the drugs prescribed, the excellent preservation of the journal has permitted a review of all drugs sold without prescriptions during the period. Entries for prescriptions were usually entered only as "pills per ℞," etc., and thus are not included in this count.



Specimen page from the Daniel B. Smith 1822-23 prescription file. Photograph courtesy of the Smithsonian Institution.

All of those which were entered over ten times each are listed below:

Cinchonin Pills *	66
Laudanum (Opium Tincture)	52
Oil resini (Castor Oil)	49
Sal Epsom (Epsom salt)	31
Rhei Syrup (Rhubarb syrup)	22
Red Bark (Cinchona rubra)	18
Opii pulv. (Powdered opium)	16
Paregoric	16
Magnesia	11
Calomel **	11

Patent Medicines were in much less demand, none making over 10 sales during the period studied. Apparently T. W. Dyott, then "patent medicine king" of Philadelphia, was getting most of this business. Proprietaries sold by Smith included:

Turlington's Balsam	4
Cox's Hive Syrup	1
Hooper's Pills	2
Haarlem Oil	1
James Powders	1
Lee's Pills	2
Feathergill's Pills	1

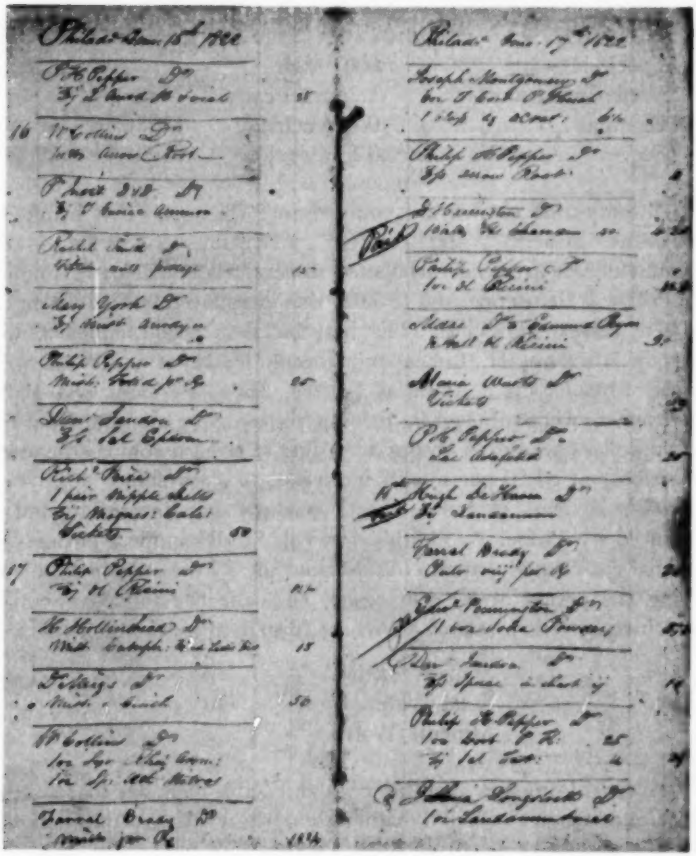
Sundries included:

Tooth brushes	6
Syringes (enema)	5
Medicine chests	4
Eye glasses	1
Surgical instruments	1 set,
Nipple shields	1
Hair pencils	1

* Cinchonin was then believed to be the active vegetable principle of cinchona bark. Duncan of Edinburgh had first prepared cinchonin in 1803 by precipitating it from an infusion of cinchona with galls. Gomez, a Portuguese physician, obtained the same principle in 1811 by the action of potassium hydroxide on an infusion of cinchona bark. Pelletier and Caventou recognized the alkaline character of this principle in 1820, naming it "cinchonine." They also discovered quinine the same year, but no mention of quinine is made in Smith's records.

** While an exact tabulation of medication prescribed was impossible, the records indicate that Calomel was far more commonly prescribed than sold "over-the-counter." In fact, it appears to have run "sal cinchonin" a close second as the drugs most often prescribed. Other drugs commonly prescribed included ipecac, senna, aloes, valerian, asafedita, gentian and digitalis.

Nearly absent from Smith's stock were the usual hardware supplies such as paints, oils, brushes, wallpaper and glass, so common in the typical drug store of the period in less metropoiitan areas (3).



Specimen page from the Daniel B. Smith 1822-23 Journal. Photograph courtesy of the Smithsonian Institution.

Pharmaceutical equipment either bought or sold included:

White vials, by the gross	$2.50/gross 2 oz.
	2.25/gross 1 oz.
Carboys	1.50/each
Filtering paper	0.87/ream
Papers pill boxes	0.13 each (probably for making 1 dozen)
Specie jars	0.10 each
Wedgewood mortars	1.25-1.50 each
Spatulas	0.84 each
Sieves	0.75

Twenty-nine entries are counted for "Tickets," two being described as "Mineral Water Tickets." According to Bishop (4) the manufacture of artificial carbonated mineral water began in London in 1792 by J. Schweppe, and in 1807 was introduced into Philadelphia by Mr. Joseph Hawkins. The first business was established that year by Abraham H. Cohen and Joseph Hawkins at 39 Chestnut Street, Philadelphia. Artificial Seltzer, Soda, Pyrmont and Ballstown waters were supplied by them at six cents a glass, and from one to two dollars per dozen bottles according to size. From the fountain, subscribers at $1.50 per month received one glass daily.

This business spread to the drug store soon thereafter, and as evidenced by Daniel B. Smith's Journal, he did quite a business in artificial carbonated waters. Aside from the 29 tickets which he sold during the period at 50 cents each, he made the following entries (which represents a sale of anywhere from 1 to a dozen bottles):

Seltzer Bottles	17
Soda Water, Bottle	10
Mineral Water	7

Among Daniel B. Smith's regular clients included the Mint of the United States which bought from 6¼ cents worth of Indigo (¼ lb.) to $49.41 worth of Aqua Fortis (183 lbs). The Deaf and Dumb Institution made regular purchases and the Christ Church Hospital and the Overseers of Friends School were occasional customers. Physicians who frequented the shop included George B. Wood and Franklin Bache. Smith appears to have bought the largest amount of his wholesale drugs from Henry Troth and Com-

pany. However, he also traded with numerous other Philadelphia druggists such as Morris and Brothers, and Solomon Temple. Only one business transaction is recorded with T. W. Dyott.

Smith's connections with the newly organized Philadelphia College of Pharmacy, which he was serving as secretary, are recorded by occasional entries such as follows:

Nov. 28, 1822	College of Pharmacy	
	Air Furnace	$ 9.12
	Castings	15.62
Jan. 1, 1823	Cash to College of Pharmacy	28.50
Jan. 17, 1823	College of Pharmacy for making hole in wall	.75

The pattern of medication of an ill patient during these times is interestingly recorded through the journal. As an example, one Daniel Jandon, who was an occasional client at the store, apparently took ill on December 31, 1822. His medication during the next 12 days are here recorded:

Dec. 31	Emplast Vesicat.	25¢
	Rx. Sal. Tart Soln. 4 oz.	18¾¢
Jan. 1	Ung. Basilicon 1 oz	12½¢
	Sal. Epsom 1 oz.	6¢
Jan. 2	Pil. Cinchon xii	50¢
	½ oz. Rad. Valerian Syr.	6¢
	1 oz. Sal. Epsom	
Jan. 3	½ oz. Rad. Valerian	
	Pil. Cinchon	50¢
Jan. 4	Rx. Calomel, Jalap chart xii	
Jan. 5	Emp. Vesicat.	50¢
Jan. 6	Pulv. vi per Rx	18¢
	2 oz. Sp. Mindes	31¼¢
	1 oz. Rad. Valerian	12½¢
	½ oz. Basilicon	
Jan. 7	Pulv. vi per Rx	15¢
Jan. 8	Emp. Vesicat.	20¢
Jan. 9	½ oz. Laudanum	12½¢
	Pulv. vi per Rx	
Jan. 11	2 oz. Laudanum	
Jan. 12	Emp. Picis Burgund.	15¢

Then after January 13, Daniel Jandon was once again only an occasional customer at the Smith store. The therapy is indicative of the times: bleed, blister and purge.

These two significant records of early American pharmacy are owned by George D. Feidt and Company of Glenside, Pa., the successors to Bullock and Crenshaw in 1901. The journal and prescription files were on loan to the Atwater Kent Museum of Philadelphia, Pa., for a time, but they are once again preserved by Feidt and Company, where they are available for study and examination by appointment.

BIBLIOGRAPHY

(1) "Memorial of Daniel B. Smith," *American Journal of Pharmacy, 55,* 22, 1883.

(2) England, Joseph W., *The First Century of the Philadelphia College of Pharmacy,* Phila. College of Pharmacy and Science, 1922.

(3) Urdang, George, "The Evolution of the Drug Store During the Past 100 Years," The Meyer Druggist, Sept., 1952.

(4) Bishop, J. L., *A History of American Manufacture from 1608 to 1860,* Edward Young and Co., Philadelphia, 1866.

SELECTED ABSTRACTS

A Study of the Action of Chlorohydrocortisone Acetate. Callow, R. K., Lloyd, J., and Long, D. A. *The Lancet II:*20 (1954). It has been found that animals may be divided roughly into two groups with regard to their reaction to the toxic effects of cortisone. One group is sensitive to cortisone and shows a marked fall in body weight. The other group is not sensitive and shows no body weight reduction. Man belongs also to the latter group, so far as reaction is concerned. When similar experimental evidence is obtained from both groups with regard to a particular phenomenon, it is likely that a general phenomenon is being studied and that that which occurred in the animals is very likely to occur in man.

When the new chloro-derivative of cortisone (9α-chloro-17α-hydroxycorticosterone) was compared with cortisone it was found that the former had greater activity than cortisone in all of the tests conducted. The growth of mice was inhibited to a greater degree and there was a higher mortality with the chloro-derivative than with cortisone acetate. The new compound was also more active than hydrocortisone acetate or cortisone acetate in causing thymus involution and liver hypertrophy in the nestling rat. In depressing sensitivity to tuberculin in B. C. G.-infected guinea pigs, 9α-chlorohydrocortisone acetate was approximately 5 times as effective as cortisone acetate.

The authors concluded that 9α-chlorohydrocortisone acetate should probably have high therapeutic activity in man.

Stramonium Poisoning. Lanich, O. K., Sr. and Ambrus, J. L. *The Pennsylvania Med. J. 57:*345-348 (Apr., 1954). A case of stramonium poisoning is described and the literature is reviewed. Differential diagnosis, special diagnostic tests, therapy, and pathomechanism are discussed. Diagnosis was confirmed in the case presented by pharmacognosic diagnosis of the plant material by Drs. Dunn and Haas at the Philadelphia College of Pharmacy and Science.

It is pointed out that stramonium poisoning is probably much more frequent than it is diagnosed. The plant is found in abundance even in city parks. In most cases, the ingested quantities are small and only mild symptoms occur which are often misdiagnosed.

Reactions to the Oral Administration of Penicillin for Mass Prophylaxis. Berry, C. Z., and Ferber, J. *U. S. A. F. Med. J. 5:*1137 (1954). In an attempt to reduce the incidence of streptococcal infections, penicillin was administered orally to a total of 33,827 airmen in basic training. Two groups, totalling 23,495 men received 250,000 units of penicillin twice a day for 10 days while 10,332 men received the same dosage for 5 days. Only 90 men (0.3 per cent) showed reactions to the antibiotic. The majority of these reactions were mild to moderate urticaria or serum sickness. This incidence of reactions was lower than usually reported following the intramuscular administration of penicillin.

The authors also found that reactions to penicillin tended to occur either within 24 hours or about 9 or 10 days after first receiving penicillin.

In an attempt to determine whether or not penicillin has an adverse effect on latent dermatophytosis, 3000 airmen were screened for evidence of latent dermatophytosis. Sixteen per cent of this group had apparent clinical evidence of fungus disease. In 17 in whom there was doubt as to the presence of fungus disease, cultural studies revealed fungi in 5. However, following treatment with penicillin only 12 of the 33,827 men showed fungus-like reactions and a positive culture was obtained in only one. Therefore, the authors concluded that it would appear that the reported dangers of activating fungus infections through the administration of penicillin have been overemphasized.

The reactions in most patients showing such were controlled with from 50 to 100 mg. of diphenhydramine hydrochloride or tripelennamine hydrochloride 4 times a day and 25 mg. of ephedrine sulfate 4 times a day for 7 to 10 days. The more severe reactions were controlled with ACTH and/or cortisone.

Aural Infections Treated With Chloramphenicol Solution. Ausband, J. R., and Harrill, J. A. *Arch. Otolaryngol. 59:*499 (1954). A solution of chloramphenicol was used in the treatment of 33 consecutive cases of aural infections with drainage. The drainage was completely relieved in 53.3 per cent and improved in 26.7 per cent of the cases. The solution which was employed was composed of

0.5 per cent chloramphenicol and 1 per cent ethyl aminobenzoate in propylene glycol.

The ears of the patients were thoroughly cleaned after a culture specimen of the drainage was taken. The patients were then instructed to place 3 drops of the solution in the affected ear 4 times a day. The period of treatment varied from 3 to 30 days. Two patients (3 draining ears) failed to return for follow up examination.

External otitis accounted for 23 of the infected ears, including the 3 on the patients who did not return for follow-up. Of the remaining 20 cases, 14 became dry and the remaining 5 showed less drainage, a decrease in swelling, and less pain. There were 7 cases of otitis media. Of this group, 2 had sensitivity reactions, one with a central perforation became dry and two showed improvement while the 2 with marginal perforations showed no improvement. Of the 3 cases of chronically draining ears following radical mastoidectomy, one became dry, one showed no improvement, and one showed a sensitivity reaction.

The authors concluded that chloramphenicol is a valuable drug for the topical treatment of otitis externa and probably also of chronic suppurative otitis media with central-type perforation of the tympanic membrane.

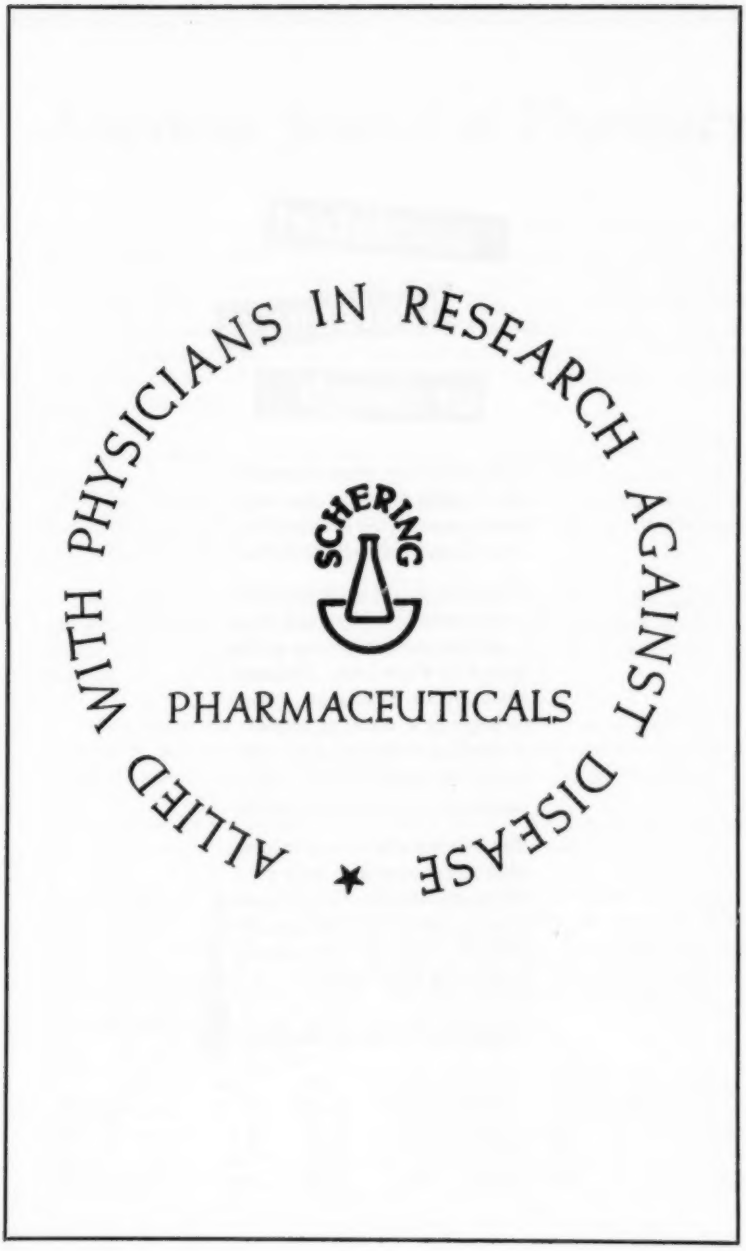
Side Reactions of Isoniazid Experimentally Reduced by Pyridoxine. Ungar, J., Parkin, K. R., Tomich, E. G. and Muggleton, P. W. *The Lancet II:* 220 (1954). Experimental studies of the toxic effects of isoniazid on rats has shown that high levels in repeated doses causes a retardation of growth rate and involution of the thymus and testes in rats, as well as a reduction in fertility of both rats and guinea pigs.

When pyridoxine was administered to isoniazid-treated rats at a rate of 3.2 mg. per Kg. per day, normal growth conditions were restored. A parallel experiment employing nicotinic acid at a dose of 20 mg. per Kg. per day instead of pyridoxine showed no restorative effect.

In vitro and *in vivo* experiments were conducted to determine whether or not pyridoxine had an effect on the antitubercular action of isoniazid. In the *in vitro* experiments two strains of human

tubercle bacilli were used in the presence of a range of concentrations of pyridoxine. No effect was observed on the inhibitory action of isoniazid on the organisms. The *in vivo* tests were conducted on mice infected with human tubercle bacilli. Four groups of mice were treated with four different dosage levels of isoniazid. Four additional groups were treated with the same doses of isoniazid plus pyridoxine in a ratio of 10:1. No significant difference was noted in the number of mice showing infection after 5 weeks.

As a result of these experiments the authors concluded that pyridoxine has a retarding effect on the side reactions to isoniazid without reducing the antitubercular activity of isoniazid. They, therefore, suggested that pyridoxine be tried in human beings who show an intolerance to isoniazid.


ALLIED WITH PHYSICIANS IN RESEARCH AGAINST DISEASE
SCHERING
PHARMACEUTICALS

persistent

hoarseness

or cough

...is one of the seven commonest danger signals that *may* mean cancer...but should *always* mean a visit to your doctor.

The other six danger signals are —Any sore that does not heal ...A lump or thickening in the breast or elsewhere...Unusual bleeding or discharge...Any change in a wart or mole... Persistent indigestion or difficulty in swallowing...Any change in normal bowel habits.

For other facts about cancer that may some day save your life, phone the American Cancer Society office nearest you, or write to "Cancer"—in care of your local Post Office.

American Cancer Society

American Journal of Pharmacy

The American Journal of Pharmacy is the oldest continuously published scientific periodical of its kind in America, having been established by the Philadelphia College of Pharmacy in 1825. After the original issue there were three other preliminary numbers until 1829, when regular publication began. From then until 1852 four issues were published annually, with the single exception of 1847, when an additional number appeared. Six issues a year were printed from 1853 to 1870, at which time the Journal became a monthly publication.

Former Editors of the Journal have been: Daniel B. Smith, 1825-1828; Benjamin Ellis, 1829-1831; Robert E. Griffith, 1831-1836; Joseph Carson, 1836-1850; William Procter, Jr., 1850-1871; John M. Maisch, 1871-1893; Henry Trimble, 1893-1898; Henry Kraemer, 1898-1917; George M. Beringer, 1917-1921, and Ivor Griffith, 1921-1941.

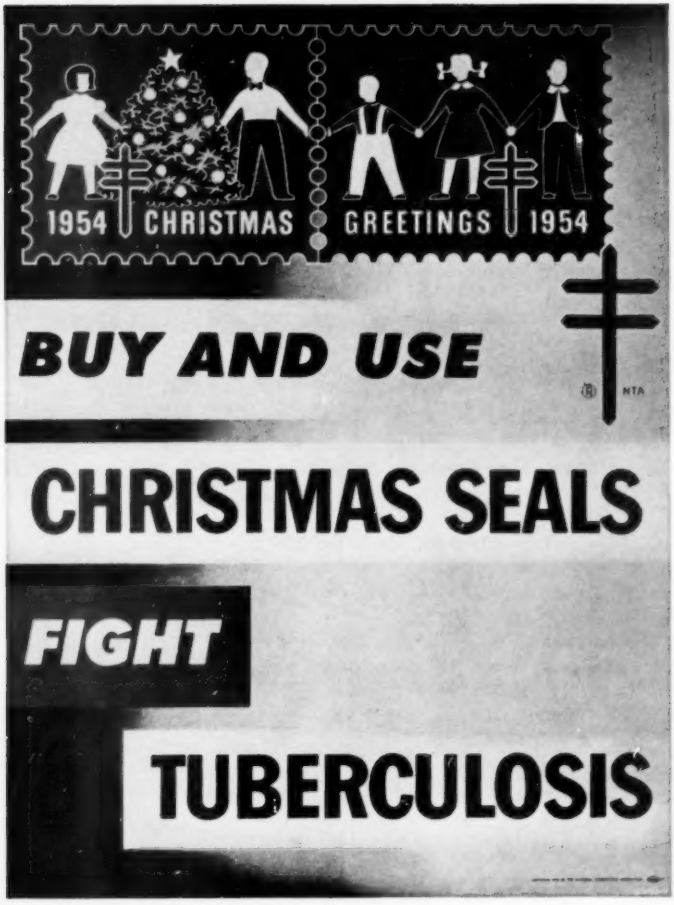
Established and maintained as a record of the progress of pharmacy and the allied sciences, the Journal's contents and policies are governed by an Editor and a Committee on Publications elected by the members of the College.

Manuscripts should be sent to the Editor, who does not assume any responsibility in connection with the views or investigations of contributors of accepted manuscripts, other than to exercise general care in selection.

Contributors are allowed a reasonable number of copies of this Journal, free of charge, if applied for when the proof is returned.

Reprints, if desired, should be ordered when the proof is returned. The table below shows the *approximate* cost of reprints, the make-up of the pages to be identically the same as in the Journal. The actual cost may vary from the figures given, and will depend upon the amount of presswork, paper, binding, and other factors. Reprints containing half-tones may be expected to cost somewhat more than the rates given.

	2 pp.	4 pp.	8 pp.	16 pp.	Covers with Titles
50 copies.....	$ 4.50	$10.00	$16.25	$27.50	50 copies..... $ 7.50
100 "	7.50	13.75	21.25	40.00	100 " 12.50
250 "	10.00	17.50	27.50	53.75	250 " 17.50
500 "	15.00	25.00	35.00	68.75	500 " 26.25


1954 CHRISTMAS GREETINGS 1954
BUY AND USE
NTA
CHRISTMAS SEALS
FIGHT
TUBERCULOSIS